

XXVI.—Some new Genera and Species of Blattidæ, with Notes on the Form of the Pronotum in the Subfamily Perisphæriinæ. By R. SHELFDOR, M.A., F.L.S.

[Plates IX. & X.]

Subfam. *ECTOBIINÆ*.

Genus *ANAPLECTA*, Burm.

Anaplecta erythronota, sp. n. (Pl. IX. fig. 9.)

♀. Head and disk of pronotum rufous. Lateral margins of pronotum hyaline. Tegmina castaneous, with the marginal area hyaline; 10 costals, 3 longitudinal discoidal sectors. Wings infuscated, marginal area not dilated, radial vein with a humeral and discoidal branch; 6 to 7 costals, median vein obsolete at base; medio-discal field twice as broad as medio-ulnar and crossed by 7 transverse venulæ; medio-ulnar field distally crossed by 2 to 3 transverse venulæ, first axillary triramose; apical area parabolic, two fifths of total wing-length, base slightly obtusely angled, crossed below the middle by an oblique vein. Abdomen beneath, cerci, and legs testaceous; abdomen above castaneous, supranal lamina transverse, narrow.

Total length 8 mm.; length of tegmina 5.4 mm.

Maskeliya, Ceylon (*E. E. Green*). Type in the British Museum.

Close to *A. maculata*, *mili*, but differs in the wing-venation as well as in the colour of the pronotum.

Subfam. *PHYLLODROMIINÆ*.

Genus *ISCHNOPTERA*, Burm.

Ischnoptera longstaffi, sp. n. (Pl. IX. fig. 8.)

♂. Testaceous. Head with a castaneous macula on the frons. Pronotum with two castaneous spots on the disk. Tegmina with radial vein bifurcated; 14 to 15 costals, 9 longitudinal discoidal sectors, the anterior ulnar vein being triramose. Wings hyaline, mediastinal vein triramose, radial vein bifurcated; 7 costals, the last two multiramose; ulnar vein with 3 complete branches and 3 or 4 incomplete branches going to the dividing vein, the more proximal minute. Sixth abdominal tergite with posterior border notched, a circular depression at base of seventh tergite marking the opening of

the scent-glands. Supra-anal lamina triangular; subgenital lamina irregularly produced, notched on the left side, with two slender styles. Front femora armed on anterior margin beneath with a complete row of spines, the distal shorter than the proximal; all the femora with genicular and apical spines.

♀. Similar, but supra-anal lamina more produced, subgenital lamina ample, semiorbicular.

♂ ♀. Total length 18–19 mm.; length of body 15 mm.; length of tegmina 15 mm.; pronotum 3·5 × 4·9 mm.

3 ♂♂, 2 ♀♀, Zambesi rain-forest (*Dr. G. B. Longstaff and Prof. T. Hudson Beare*).

Types in Oxford Museum.

The species is allied to *I. bimaculata*, Gerst., from E. Africa, but differs in the secondary sexual characters of the male.

Subfam. *BLATTINÆ*.

Genus *PROTAGONISTA*, nov.

Antennæ slightly incrassated. Position of antennal sockets variable. Pronotum as long as broad, quadrangular, with rounded angles, sides not deflexed. A fine erect pubescence covers both pronotum and tegmina. Tegmina and wings fully developed in the male. Tibial spines in two rows. Posterior metatarsus longer than the remaining joints, all the pulvilli apical. Arolia minute.

The genus is remarkable on account of the shape of the pronotum and the pubescence on pronotum and tegmina. In one of the species the eyes are closer together than the antennal sockets, in the other they are further apart; I doubt if this character is of much importance, and it hardly seems advisable to separate the New-World genera of Blattinæ from the Old-World genera on the strength of this character alone.

Protagonista lugubris, sp. n. (Pl. IX. fig. 1.)

♂. Piceous. Head finely punctate; labrum, clypeus, and palpi testaceous; ocelli * prominent, testaceous; eyes further apart than antennal sockets. Antennæ fuscous, slightly incrassated, pubescent, but not plumose, apical joints testaceous. Pronotum not covering vertex of head, coarsely reticulate-punctate, with some smooth interspaces and lines; a deep, wide, semilunar impression extending across the

* They appear to be true ocelli as in the subfam. Corydiinæ, and not *fenestræ* as in the other subfamilies.

anterior third and down the sides to near the posterior angles; a short transverse impression just behind the anterior margin. Tegmina exceeding the apex of the abdomen, semicorneous and seriatly punctate at base, marginal field deflexed at base and fimbriate, anal vein obsolescent. Abdomen with disk rufo-castaneous; supra-anal lamina subquadrate, posteriorly emarginate; subgenital lamina subquadrate, with a pair of long styles. Cerci moderate, rufous. Legs rufo-castaneous, the tibiæ with a fine recumbent pubescence. Front femora with a complete row of spines on front margin beneath, none on posterior margin; mid and hind femora somewhat rounded beneath and with only one spine on each margin. Tibial spines sparse, arranged in two rows. Posterior metatarsus very long, succeeding joints rather short.

Total length 25 mm.; length of body 23.5 mm.; length of tegmina 19 mm.; pronotum 5.9 × 6 mm.

Manson Mts., Tonkin (type in Oxford Museum); Yen-Bai, Central Tonkin (co-type in Paris Museum).

Protagonista borneensis, sp. n. (Pl. IX. fig. 2.)

♂. Head piceous, opaque, with a few scattered punctures, mouth-parts piceous; eyes closer together than antennal sockets. Antennæ with moniliform joints, shorter than the body, piceous, with a testaceous band near the apex. Pronotum opaque piceous, with scattered erect pubescence; a shallow transverse impression in anterior third and two oblique impressions in posterior third. Tegmina rufo-castaneous, exceeding the apex of the abdomen, narrow; marginal field narrow, deflexed; anal vein well-marked, reaching nearly halfway down the sutural margin. Abdomen piceous, with the basal segments rufescent above, testaceous below. Supra-anal lamina quadrately produced, posterior angles spiniform, posterior margin concave, exceeded by the subgenital lamina, which is semiorbicular, and provided with a pair of slender styles. Cerci long, acuminate, castaneous. Front legs castaneous, mid and hind legs with the coxæ (except at the base) and the femora (except at the apex) testaceous, otherwise castaneous. Front femora with a complete row of spines on anterior margin beneath, two or three on posterior margin; mid and hind femora with 5 to 7 spines on each margin. Tarsal arolia larger than in the preceding species.

Total length 25 mm.; length of body 20 mm.; length of tegmina 20 mm.; pronotum 4.8 × 4.1 mm.

Sarawak, Borneo (*Shelford*). Type in Oxford Museum.

Genus ARCHIBLATA, Voll.

? *Archiblatta parva*, sp. n.

♀. Rufo-testaceous, all the segments margined and speckled with castaneous. Head castaneous, the vertex paler, finely punctate, nitid; antennæ and mouth-parts rufo-castaneous, antennæ slender, setaceous [mutilated]. Eyes further apart than antennal sockets. Upper surface of body scabrous, nitid. Pronotum trapezoidal, anteriorly truncate, posterior margin slightly obtusely angled; posterior angles of all the thoracic tergites slightly produced. Posterior angles of abdominal tergites not produced; supra-anal lamina subquadrate, posteriorly emarginate, angles rounded, dark castaneous in colour, margined with testaceous. Body beneath and legs uniform castaneous, abdominal sternites laterally scabrous; antepenultimate sternite with a large deep puncture on each side, bordering the subgenital valves. Cerci shorter than the supra-anal lamina. Front femora with a complete row of spines on anterior margin beneath, one on the posterior margin; mid femora with 4-5 spines on anterior, 2-3 on posterior margin; hind femora with 4 spines on anterior, 1 on posterior margin; all these spines very small. Tibial spines in three rows, but the middle row very incomplete. Posterior metatarsus equal to remaining joints; pulvilli large, occupying nearly the entire length of every joint.

Total length 23 mm.; pronotum 6×8.5 mm.

Towranna plains, W. Australia (*E. Clement*). Type in Oxford Museum.

I place this very curious insect provisionally in *Archiblatta*, but in many of its characters it does not conform to that genus, and eventually it may be necessary to erect a new genus for its reception.

Subfam. *CORYDIINÆ*.Genus *CARDAX*, nov.

♂. Minute, slender, with fine recumbent pubescence. Antennæ nearly as long as body, finely pubescent. Ocelli present. Head with vertex covered by the pronotum; eyes wide apart; frons slightly inflated. Lacinia of maxillæ slender. Pronotum trapezoidal, bent downwards, forming an angle with rest of body, a broad transverse impression at its base. Scutellum exposed. Tegmina extending considerably beyond apex of abdomen, delicate, membranous, hyaline, finely fimbriate, and with minute recumbent pubescence;

radial vein bifurcate from near base, costal veins absent, anterior ulnar simple, posterior ulnar simple or bifurcate, anal field much reduced, anal vein straight, oblique, one axillary vein. Wings similar in size, texture, and pubescence to the tegmina; posterior part of the wing reduced to a small lobe, not pubescent, with one obsolescent axillary vein; radial vein simple, no costal veins; median vein bifurcate from near base, its anterior branch bifurcating near apex; ulnar vein bifurcate. Vena spuria present in both tegmina and wings. Supra-anal lamina subquadrate, posterior border arcuately emarginate. Subgenital lamina rounded, slightly irregular, without styles. Cerci elongate, nine-jointed, apical joint acuminate. Legs slender, long; tibiæ sparsely spined, the spines on the posterior pair biserially arranged; femora with genicular spines; tarsal claws minute, without arolia; no pulvilli; posterior metatarsus longer than the remaining joints.

Cardax willeyi, sp. n. (Pl. IX. figs. 3-7.)

♂. Fusco-hyaline; tegmina with a slight iridescent sheen; legs testaceous. Front tibiæ with four apical spines, otherwise unarmed; mid tibiæ with two spines near the base and three apical spines; hind tibiæ with four spines along the outer border and three apical spines.

Total length 5.9 mm.; length of body 3.8 mm.; length of tegmina 5 mm.; greatest breadth of tegmina 2 mm.

Peradeniya, Ceylon (*A. Willey*); several specimens. Type in the British Museum; co-type in the Oxford Museum.

This is certainly one of the most remarkable cockroaches known. In general appearance it is far more like a small Neuropterous insect than like an Orthopteron, an effect brought about by the similar texture and pubescence of the tegmina and wings; this is a feature shown, to a limited extent, by the genus *Homopteroidea*, mihi, but by no other genera in the family. In the subfamily Corydiinæ the posterior part of the wing does not fold up in a fan-like manner, but merely doubles under the anterior part, which leads in some instances to a reduction in size of the posterior part, so that it becomes equal in size or even smaller than the anterior part. In *Cardax* the reduction has proceeded so far that the posterior part of the wing is represented merely by a small functionless lobe; and it is interesting to note that, correlated with this reduction, is a parallel reduction of the anal field of the tegmina. The anterior part of the wings is relatively much larger than is usual in Blattidæ. The venation of the

alar organs is much simplified and approximates to a radiate type, there being but little branching of the veins. The minute tarsal claws constitute another highly remarkable character. It is difficult to discover the affinities of a genus so aberrant as this; the biseriata arrangement of the tibial spines shows that it must be placed in the section of the subfamily which embraces *Latindia*, Stål, *Paralattindia*, Sauss., *Homopteroidea*, Shelf., &c.; but it cannot be regarded as closely related to any known genus.

Subfam. *PERISPHERIINÆ*.

The Form of the Pronotum in the Perisphæriinæ.

De Saussure and Zehntner, in their revision of the Perisphæriinæ (Rev. Suisse Zool. vol. iii. 1895), have traced the evolution of the complex type of pronotum of such genera as *Pilema* and *Cyrtotria* [= *Stenopilema*, Sauss.] from a simple type. A summary of their conclusions may be presented here, and I have added some diagrammatic figures as a help to its elucidation. In a typical Blattid pronotum two areas may be distinguished, the disk and the lateral wings, which project on either side beyond the outer limits of the prosternum; the disk covers the head and on the *underside* is more or less defined by a pair of carinæ, known as the typical carinæ. In transverse section this form of pronotum may be represented as in Pl. IX. fig. 10, A, where *a* represents the disk, *bb* the lateral wings, and *cc* the typical carinæ. In the genus *Pronaonota* (Pl. IX. fig. 10, B) the lateral wings are strongly bent downwards and an incomplete carina (*d*) on the deflected sides of the dorsal surface of the pronotum foreshadows the separation of the lateral wings from the disk. The separation is more or less complete in the genera *Pilema* and *Cyrtotria* (Pl. IX. fig. 10, C); the lateral wings in these genera now appear in side view as lateral bands bent down at a right angle, or at more than a right angle, to the disk of the pronotum, and their upper (morphologically inner) border is elevated, so that in dorsal view it appears as if the lateral borders of the pronotum had been simply reflected from below upwards. Such, however, is not really the case; the carina on the pronotum of *Pronaonota* is the morphological equivalent of the upper edge of the lateral band of *Pilema*, and the lateral margin of the pronotum of *Pronaonota* is the equivalent of the lower edge of the lateral band of *Pilema*. This lateral band is morphologically the lateral wing of the pronotum, which has become divided off from the disk,

rotated outwards through some degrees, and, owing to a greater or less elevation of its upper border, is now separated dorsally from the disk of the pronotum by a channel or groove of varying depth. Frequently, though by no means always, the development of the lateral bands is accompanied by a slight upward reflection of the anterior margin of the pronotum. The upper edge of this reflected border is continuous with the upper edge of the lateral bands; the lower edge, when seen from the ventral aspect, is occasionally continuous with the lower edge of the lateral bands, as in *Cyrtotria jalle*, Gig.-Tos (Pl. X. fig. 19), in which case the lateral bands are connected anteriorly with each other, but more frequently the lower edge of the anterior reflection is not evident and the lateral bands are not connected with each other anteriorly (Pl. X. fig. 13).

In the species of the genus *Bantua* (Pl. IX. fig. 10, D), the rotation of the lateral bands has been carried still further, *i. e.* outwards, downwards, and then inwards, so that now the lateral bands form a very acute angle with the disk of the pronotum and lie underneath it; the gutter or channel is obliterated, just as a fold in a piece of cloth vanishes when the part of the cloth involving the fold is tightly wrapped round some solid object. The outer border of the pronotal disk is now the outer margin of the pronotum. A new species of *Pilema* and a new species of *Bantua* described below illustrate in a most striking and interesting manner the rotation of the lateral bands of the pronotum, with concomitant obliteration of the gutter separating the bands from the disk. Finally, in the genus *Derocalymma* (Pl. IX. fig. 10, E) the lateral bands are bent still further under the disk and lie in almost a parallel plane with it; at the same time the pronotum is broader, it has reverted to the primitive flattened shape, but its outer lateral margins are now not the morphological equivalents of the outer lateral margins of the primitive type, but the equivalents of the inner boundaries of the lateral wings of that.

The whole series of specimens illustrates admirably the evolution of a complex type of pronotum from a simple type, the former superficially resembling the latter. It is by no means often that the entomologist is supplied with such a series of gradations, and it is generally far easier to hazard a suggestion as to the value to the species of certain structures, than to elucidate their mode of origin. Here it is otherwise; we can see pretty clearly the steps whereby the pronotum of *Derocalymma* evolved from a more primitive type, but the value to the species of these variations in structure is by no

means evident at first sight. A knowledge of the habits of an animal should invariably precede all suggestions as to the value of any details of its structure, and I feel convinced that much of the mystery surrounding variations in structure which are spoken of as being merely of importance to the systematic naturalist will be dispelled as our knowledge of the life-histories of the animals exhibiting them increases. A clue to the use of the variations in pronotal structure of the cockroaches under notice is afforded by the observations, slight and incomplete though they are, on their habits. The vast majority of Blattidæ are insects of cryptic habits, spending most of their life hidden under stones or logs, in decaying vegetation, burrowing in rotten wood, and so forth, and the majority of species are flattened depressed insects. The species of *Pilema*, on the other hand, are convex and more or less cylindrical insects with a large heavy pronotum, the anterior border of which is often slightly reflexed and bounded laterally by the upwardly projecting lateral wings.

Mr. Distant, in his 'Insecta Transvaaliensia,' has recently published an interesting field-observation on the habits of a species identified as *Pilema thoracica*, Walk. A female accompanied by several larvæ was taken from the bottom of a neat round hole in the ground about 6 inches in depth; there were half a dozen such holes in about half an acre, and all contained families of this species. I have no doubt but that all the species of this genus have adopted this mode of life, and that the pronotum is the part of the body that is used in excavating the burrows, for on examining some specimens of *P. reflexa*, Walk., and *P. hebetata*, Sss. & Z., in the British Museum, I found that in these the channel between the pronotal disk and lateral bands was simply choked with earth. It is not unreasonable to assume that the heavy shovel-like pronotum of *Pilema* has been evolved in response to a change of habitat. Turning now to the other end of the series of cockroaches considered, we find that the species of *Derocalymma* are the most flattened members of the whole family, and in correspondence with this depressed form it is no surprise to learn that they live under heavy stones. The advantage of the flattened form, enabling the insects to slip through narrow crevices and to lie in security in a circumscribed shelter beneath a stone too heavy for any but a relatively powerful enemy to move, is obvious; and, again, it is not unreasonable to assume that the highly modified pronotum of *Derocalymma* is a result of a change of habitat. There is no information forthcoming as to the habits of *Bantua* and *Cyrtotria*; some species of the

latter genus have the pronotum well adapted for digging, but others have not, and it would be of the greatest interest to learn if the habits of the species vary in correlation with the form of the pronotum.

Bantua is intermediate in structure between *Cyrtotria* and *Derocalymma*; some specimens collected by Dr. Longstaff in S. Africa were taken from beneath a log, which means, I expect, that they were lurking in the rubbish immediately surrounding the log, as they are not adapted, like *Derocalymma*, for life beneath a heavy body, judging by their facies.

Finally, the question arises, has *Derocalymma* originated from a form like *Pilema*, passing in the course of its evolution through a *Bantua*-like stage? One is tempted to answer in the affirmative, for adaptation to life beneath stones could have been brought about by mere flattening of a generalized type of cockroach with a simple form of pronotum, as has indeed occurred in the Australian genus *Oniscosoma*, superficially similar to *Derocalymma*, but structurally widely different. The highly modified pronotum of *Derocalymma* has resulted from the flattening not of a simple form of pronotum, but of a complex form with lateral bands; the lateral bands in *Pilema* are the most essential parts of the excavating organ, the pronotum; but they can serve no useful purpose in species that do not burrow into the ground, and the manner of their modification in response to a different habit of life is shown in the genus *Bantua*, and especially in the new species of that genus described below, the final step in the process being exhibited by *Derocalymma*.

Genus BANTUA, nov.

Cyrtotria, Saussure and Zehntner (nec Stål), Rev. Suisse Zool. iii. p. 28 (1895).

Differs from *Pilema*, Sauss., and *Cyrtotria*, Stål, in the form of the pronotum, the lateral bands being bent under the disk and forming an acute angle with it; the margin of the pronotal disk forms the outer margin of the pronotum. In the female the posterior angles of the pronotum are more or less produced backwards. Differs from the genus *Derocalymma*, Burm., by the less complete bending under of the lateral bands of the pronotum, by the membranous tegmina of the male, and the backwardly produced posterior angles of the pronotum in the female.

Type of genus. *Perispheria dispar*, Burm.

Bantua ferox, sp. n. (Pl. X. fig. 25.)

♀. Piceous, nitid. Head cribrate-punctate; distance apart of eyes less than length of first antennal joint; antennæ castaneous; ocelli, labrum, and maxillary palpi rufo-testaceous. Pronotum rugose, lateral bands anteriorly deflected inwards, posteriorly strongly produced backwards, and bent downwards at a right angle to the disk of the pronotum; a broad channel dorsally separates the posterior part of the band from the disk; the disk of the pronotum anteriorly is tuberculate, posteriorly with a few deep punctures, posterior margin dentate. Mesonotum rugose, cribrate-punctate; posterior angles tumid, produced, anterior angles depressed and fitting beneath the posterior angles of the pronotum. Metanotum less deeply punctate; posterior angles tumid, produced. Abdomen rather wider than thorax, finely punctate above and beneath, a narrow anterior zone on each tergite and sternite impunctate; supra-anal lamina trapezoidal, posterior margin slightly reflected. Cerci testaceous.

Total length 27.8 mm.; pronotum 8 × 10 mm.

Nyika Mts., 6000-7000 feet, Nyasaland (*A. Whyte*, July 1896).

Type in the British Museum.

The pronotal structure of this species is of great interest, for whilst anteriorly the lateral bands lie under the disk, forming a very acute angle with it, as is characteristic of a typical *Bantua*, posteriorly they are vertical and form more or less of a right angle with the disk, as is characteristic of a typical *Pilema*. Correlated with this torsion of the lateral bands is the entire absence of the pronotal gutter or channel anteriorly, whilst posteriorly it is deep and plainly visible. The structure illustrates quite clearly that the bending under the disk of the lateral bands brings about the obliteration of the gutter; speaking rather metaphorically, the material of which the pronotum is composed is stretched taut by the rotation inwards of the lateral bands, so that the fold in the material disappears; where the rotation is of less extent there is enough material to form a fold or channel. A diagrammatic section through the front part of the pronotum of *B. ferox* will resemble Pl. IX. fig. 10, D, but a similar section through the hinder part will resemble Pl. IX. fig. 10, C.

Genus *PILEMA*, Sauss.*Pilema mombasæ*, sp. n. (Pl. X. figs. 22, 23.)

♀. Piceous, nitid. Head with face rugose and slightly

punctate; eyes very close together; antennæ and labrum castaneous, maxillary palpi rufo-testaceous; ocelli not visible. Pronotum above with disk rugose, punctate and anteriorly tuberculate; anteriorly obtusely carinate, anterior margin reflected slightly, lateral bands anteriorly deflected downwards, but not so much as in *Bantua ferox*; the channel between the disk and the lateral bands wide and shallow; posteriorly the lateral bands are produced as in *Pilema dentata*, Sauss. & Zehnt.; posterior margin dentate. Meso- and metanotum cribrate-punctate, with smooth interspaces and a median carina, posterior angles slightly produced. Abdomen not wider than thorax, obsoletely punctate above and beneath; an anterior zone on each tergite and sternite impunctate; supra-anal lamina trapezoidal. Cerci and legs castaneous.

Total length 28 mm.; pronotum 8.5 × 8.9 mm.

Mombasa (1 ♀).

Type in the British Museum.

The species is in its pronotal structure intermediate between *Bantua ferox* and typical *Pilema*.

Genus CYRTOTRIA, Stål.

Stenopilema, Sauss. Ann. Mus. Civ. Genova, xxxv. p. 87 (1895); Sauss. & Zehnt. Rev. Suisse Zool. iii. p. 25 (1895).

Thysanoblatta, Kirby, Ann. & Mag. Nat. Hist. (7) xii. p. 380 (1903).

The type of the genus is *C. gibbicollis*, Stål, and this species is undoubtedly congeneric with the species included in *Stenopilema* by de Saussure and Zehntner. *Thysanoblatta* was founded on a species characterized by an erect pubescence, but otherwise differing in small details only from typical species of *Stenopilema*; and I have no hesitation in sinking it as a synonym of *Cyrtotria*. There has been an excessive multiplication of genera in this subfamily of Blattidæ, and much confusion has resulted therefrom.

The species of *Cyrtotria* are very difficult to identify from descriptions, for it is not easy to express in writing the subtle differences in the form of the pronotum presented by the different species. I have examined nearly all the types, and have drawn up a synoptical key to the species, which, together with the figures, will I hope render the determination of the species easier than heretofore.

Two species of the genus, *C. latipennis*, Kirby, and *C. pallicornis*, Kirby, present a remarkable modification of the pronotum, which appears to have been overlooked by the describer. The disk of the pronotum on each side is perfo-

rated by three (*latipennis*) or two (*pallicornis*) pores of relatively large size and semilunar in shape; the tongue of chitin projecting into the crescentic pores is tuberculate in *pallicornis*, but simple in *latipennis*. It is difficult even to guess at the function of these pores. Since they occur in both sexes, it is evident that they are not secondary sexual structures; but it is just possible that they are connected with prothoracic repugnatorial glands, though such have not yet been shown to occur in the Blattidæ. The pronotal integument appears to be double in the region of these pores, and the pores appear to lead into a cavity existing between the upper and lower layers, and not to perforate the entire integument, for a bristle passed through one of them does not emerge on the ventral side of the pronotum. Without dissection it is not possible to be certain as to the relation of the parts, and the pores may be merely the entrances to invaginated cavities in the thickness of the pronotal chitin.

Key to the Species.

Males.

1. Pronotum and abdomen with erect pubescence. [E. Africa.]
 2. Pronotum with large lateral pores *latipennis*, Kirby. (Brit.)
 - 2'. Pronotum without large lateral pores. *macra*, Stål. (S. Africa.)
- 1'. Pronotum and abdomen not pubescent. [boon.]
 2. Posterior margin of pronotum dentate *scabricollis*, Gerst. (Ga-)
 - 2'. Posterior margin of pronotum not dentate.
3. Tegmina scarcely exceeding the apex of the abdomen *gibbicollis*, Stål. (Natal.)
- 3'. Tegmina considerably exceeding the apex of the abdomen.
4. Small species (total length about 38 mm.) *poduriformis*, Walk. (S. [Africa.])
- 4'. Larger species.
 5. Tegmina pale testaceous, castaneous at base *capucina*, Gerst. (E. Africa, Somaliland.) (Germ.)
 - 5'. Tegmina uniform castaneous *marshalli*, sp. n. (Rhodesia.) [desia.]

Females.

1. Body slender, elongate: species of small size. [Africa.]
 2. Pronotum much longer than broad *poduriformis*, Walk. (S.)
 - 2'. Pronotum scarcely longer than broad or as broad as long.
 3. Abdominal segments scabrous *graniger*, Sauss. & Zebnt. [(Somaliland.)]
 - 3'. Abdominal segments smooth *nyasa*, sp. n. (Nyasa-land.)
- 1'. Body less slender, abdomen sometimes amplified: species of larger size.
 2. Pronotum distinctly broader than long.

3. Lateral bands of pronotum narrow,
no pores in pronotal channel *gibbicollis*, Stål.
- 3'. Lateral bands of pronotum broader,
two large pores in pronotal channel. *pallicornis*, Kirby. (Trans-
vaal.)
- 2'. Pronotum as long as broad or longer
than broad.
3. Lateral bands of pronotum very [Zambesi, Port. E. Africa.]
broad, anterior margin reflected .. *Jalle*, Gig.-Tos. (Upper
Jalle, Gig.-Tos. (Upper
- 3'. Lateral bands narrower.
4. Lateral bands closely adpressed to
disk of pronotum *capucina*, Gerst.
- 4'. Lateral bands not closely adpressed
to disk of pronotum.
5. Lower border of lateral bands [desia.)
not dentate *marshalli*, sp. n. (Rho-
Africa.)
- 5'. Lower border of lateral bands [Africa.)
dentate *scabricollis*, Gerst. (West

Species of doubtful position.

Perisphæria fusca, Burm., and *P. gracilis*, Burm.

1. *Cyrtotria latipennis*, Kirby. (Pl. X. fig. 21.)

Thysanoblatta latipennis, Kirby, Ann. & Mag. Nat. Hist. (7) xii. p. 380
(1903).

The following may be added to the original description:—

♂. Eyes touching on vertex of head. Palpi, margin of labrum, ocelli, and base of antennæ testaceous. Head castaneous, punctate. Pronotum coarsely reticulate-punctate, with some smooth interspaces; lateral bands rather narrow, not closely adpressed to disk, channel wide and shallow; three large crescentic pores on each side of the disk; posterior margin slightly dentate, anterior margin slightly reflected; disk anteriorly carinate.

Length of body 20·8 mm.; length of tegmina 21 mm.; pronotum 6·1 × 6 mm.

British E. Africa.

Type in the British Museum.

2. *Cyrtotria macra*, Stål. (Pl. X. fig. 11.)

Ischnoptera macra, Stål, Cefv. Vet.-Akad. Förh. xiii. p. 165 (1856).

Derocalymma (Cyrtotria) macra, Stål, l. c. xxviii. p. 380 (1871).

Description of type.—♂. Head castaneous; eyes close together, their distance apart equal to the breadth of the first antennal joint. Pronotum reticulate-punctate, with a long erect scattered pubescence, pale testaceous in colour. Lateral bands of pronotum not very broad, closely applied to the disk, channel very narrow. Tegmina hyaline, castaneous at base.

Wings hyaline; ulnar vein 8-ramose, only three of the branches being complete. Abdomen castaneous, ventrally with scattered erect pubescence. Legs testaceous, with scattered erect hairs.

Total length 15.9 mm.; length of body 12 mm.; length of tegmina 11.8 mm.; pronotum 3.1×3 mm.

Hab. Caffraria (*J. Wahlberg*).

Type in Stockholm Mus.

This is one of the smallest species of the genus.

3. *Cyrtotria gibbicollis*, Stål. (Pl. X. fig. 12.)

Ischnoptera gibbicollis, Stål, *Cefv. Vet.-Akad. Förh.* xiii. p. 165 (1856).

Perisphæria elateroides, Walker, *Cat. Blatt. Brit. Mus.* p. 176 (1868).

Perisphæria linearis, Walker, *l. c.* p. 176 (1868).

Perisphæria cylindrica, Walker, *l. c.* p. 176 (1868).

Derocalymma (Cyrtotria) gibbicollis, Stål, *l. c.* xxviii. p. 380 (1871).

♂ (type). Head castaneous; eyes approximate; mouth-parts testaceous; antennæ infuscated, testaceous at base. Pronotum as broad as long, coarsely cribrate-punctate, with smooth interspaces; castaneous, anteriorly testaceous; lateral bands narrow, not very closely adpressed to disk, an anterior carina. Tegmina not exceeding the body by much, rufo-castaneous in basal third, remainder flavo-hyaline; veins testaceous. Wings clear hyaline; ulnar with ten branches, eight of which are incomplete. Abdomen castaneous, margined with testaceous; subgenital lamina irregular, with one style; cerci flavo-testaceous. Femora and coxæ rufo-castaneous; tibiæ and tarsi testaceous.

♀ (type). Piceous, nitid, sparsely punctate. Head piceous, mouth-parts and antennæ testaceous. Lateral borders of pronotum very narrow, scarcely elevated, closely adpressed to disk; no anterior carina. Abdomen slightly amplified; supra-anal lamina trapezoidal; cerci very short, flavid; legs rufo-castaneous.

♂. Total length 16.8 mm.; length of body 14 mm.; length of tegmina 14 mm.; pronotum 4.9×5 mm.

♀. Total length 13 mm.; pronotum 3.5×4.5 mm.

Caffraria (*J. Wahlberg*, types in Stockholm Museum); Natal (*elateroides*, *cylindrica*, and *linearis*, types in British Museum); Colenso (*G. Longstaff*, Oxford Museum).

I have compared the types of all the species enumerated in the synonymy, and though at first I was inclined to regard *cylindrica* as distinct, I have now come to the conclusion that it is a fully adult form, whereas *gibbicollis* was described from an incompletely mature form. I have had the

advantage of examining a very long series of *C. capucina*, Gerst., taken by Dr. Y. Sjöstedt in the Kilimanjaro district, and I am convinced that the shape of the abdomen (ampliated or not ampliated) is a character of no importance in discriminating between species of this genus, for it varies with the age of the insect and is largely affected by the way in which the specimens are dried or killed. Some of Dr. Sjöstedt's examples were almost completely cylindrical, others had the abdomen distinctly ampliated; yet there could be no doubt that all were referable to the same species. Similarly, apart from its size and the shape of the abdomen, *C. cylindrica*, Walk., differs in nowise from *C. gibbicollis*, Stål.

4. *Cyrtotria capucina*, Gerst. (Pl. X. fig. 13.)

Derocalymma capucina, Gerstaecker, Arch. Naturg. xxv. p. 207 (1861);
 Von der Decken, Reis. in Ost-Afrika, iii. (2) p. 8, pl. i. fig. 4 (1873).
Stenopilema somali, Saussure, Ann. Mus. Genova, xxxv. p. 88 (1895);
 Saussure and Zehntner, Rev. Suisse Zool. iii. p. 27 (1895).

To be distinguished from *C. gibbicollis*, Stål, by the antennæ testaceous at the base, by the proportions and shape of the pronotum, the lateral bands of which are broader and anteriorly are more separated from the disk. I have examined the type of *C. somali*, Sauss., which proves to be identical with Gerstaecker's species.

♀. Total length 18–18.5 mm.; pronotum 5 × 5 mm.

The male will be described in a forthcoming memoir on the Blattidæ of Mt. Kilimanjaro.

Hab. German East Africa, Mt. Kilimanjaro, and Somali-land.

Type of *capucina* in the Berlin Museum; type of *somali* in the Museo Civico di Storia Naturale, Genoa.

5. *Cyrtotria pallicornis*, Kirby. (Pl. X. fig. 16.)

Stenopilema pallicornis, Kirby, Ann. & Mag. Nat. Hist. (7) v. p. 290 (1900).

The following may be added to the original description:—

♀. Piceous, nitid, cribrate-punctate. Head and antennæ castaneous, mouth-parts rufo-castaneous. Pronotum slightly broader than long; lateral bands narrow, slightly elevated, not closely adpressed to disk; pronotal channel wide; two large crescentic pores, close together, on each side of the disk; posterior angles produced, disk anteriorly carinate. Abdomen less strongly punctate than the thorax. Coxæ and femora piceous; tibiæ rufo-castaneous; tarsi testaceous.

Total length 13 mm. ; pronotum 4.5 × 6 mm.

Pretoria (*W. L. Distant*); Zoutpansberg, Transvaal (*J. P. Cregoe*).

Type in the British Museum.

6. *Cyrtotria poduriformis*, Wlk. (Pl. X. fig. 14.)

Perisphæria poduriformis, Walker, Cat. Blatt. Brit. Mus. p. 175 (1868).

Perisphæria poduroides, Walker, l. c. p. 175 (1868) (larva).

Stenopilema macilenta, Saussure and Zehntner, Rev. Suisse Zool. iii. p. 26, pl. i. fig. 3 (1895).

I have compared the types of *poduriformis* and *macilenta*, and find them to be identical; *poduroides* is a larva. It is possible that the species is the same as *gracilis*, Burm., but I cannot be certain on this point without consulting Burmeister's type. The small size, narrow cylindrical shape, the somewhat flattened pronotum, much longer than broad and with the lateral bands adpressed to the disk at the base only, are the chief characters of this species. I append a description of what I consider to be the male of this species:—

♂. Rufo-castaneous. Head castaneous, distance apart of eyes equal to breadth of first antennal joint. Pronotum coarsely cribrate-punctate, with a few smooth interspaces, carinate throughout its length, lateral bands not closely adpressed to the disk; posterior angles not produced, anterior and posterior margin slightly reflexed. A very fine, short, erect pubescence on the disk of the pronotum. Tegmina considerably exceeding the apex of the abdomen, paler towards apex. Abdomen castaneous beneath, except at base, which is testaceous. Legs and cerci testaceous.

Total length 37.5 mm.; length of body 15 mm.; length of tegmina 15 mm.; pronotum 4 × 3 mm.

Damaraland; Natal; Cape Colony.

♂ type in the Oxford Museum; ♀ type of *poduriformis* in British Museum; ♀ type of *macilenta* in Geneva Museum.

7. *Cyrtotria graniger*, Sauss. & Zehnt.

Stenopilema graniger, Saussure and Zehntner, Rev. Suisse Zool. iii. p. 26 (1895).

I do not know where the type of this species has been deposited; it is not in the Geneva Museum. The key to the species shows how *graniger* may be distinguished from its ally *poduriformis*.

8. *Cyrtotria marshalli*, sp. n. (Pl. X. fig. 15.)

♂. Castaneous. Head piceous; ocelli, basal joint of antennæ, and mouth-parts testaceous. Eyes approximated. Pronotum as long as broad, punctate and rugulose; anterior margin scarcely reflected; lateral bands narrow, not adpressed to the disk of the pronotum, posterior margin slightly elevated, posterior angles not produced. Tegmina not exceeding body by much, apical half hyaline suffused with castaneous; veins fuscous. Wings hyaline, anterior part suffused slightly with castaneous; ulnar vein with nine branches, only three of which reach the apex of the wing. Abdomen above testaceous at base, becoming castaneous towards apex, beneath castaneous; supra-anal lamina subquadrate, angles rounded, subgenital lamina produced, irregular, margined with testaceous; one style. [Cerci mutilated.] Legs rufo-castaneous.

♀. Piceous, nitid, cribrately punctate. Head piceous, mouth-parts castaneous. Pronotum with lateral bands moderately broad, not adpressed to disk of pronotum, anterior margin scarcely reflected, pronotal channel broad and shallow, posterior angles produced, disk anteriorly with a slight keel. Abdomen posteriorly slightly amplified. Coxæ piceous; femora and tibiæ castaneous.

♂. Total length 26 mm.; length of body 22.5 mm.; length of tegmina 20 mm.; pronotum 5 × 5 mm.

♀. Total length 22 mm.; pronotum 6 × 6 mm.

Salisbury, Rhodesia (*G. A. K. Marshall*), 3 ♂♂ and 1 ♀.

Types (♂ and ♀) in the Oxford Museum.

Allied to *C. poduriformis*, but differs, *inter alia*, by its much larger size.

9. *Cyrtotria nyasæ*, sp. n. (Pl. X. fig. 17.)

♀. Piceous, nitid, narrow and cylindrical. Head castaneous, with very few punctures; eyes wide apart; palpi and margin of labrum testaceous. Thorax cribrate-punctate, abdominal segments smooth. Pronotum rounded and very convex; lateral bands rather broad, closely adpressed to disk, slightly produced backwards, anterior margin not reflected; disk not carinate. Supra-anal lamina rounded; posterior margin reflected, punctate. Legs and cerci testaceous.

Total length 15 mm.; pronotum 4.2 × 4 mm.

Nyasaland (*A. Whyte*).

Type in the British Museum.

The blunt convex pronotum makes this an easily recognizable species.

10. *Cyrtotria jallæ*, Giglio-Tos. (Pl. X. fig. 19.)

Stenopilema jallæ, Giglio-Tos, Boll. Mus. Torino, xxii. no. 563, p. 4 (1907).

Upper Zambesi (*Jalla*); Portuguese East Africa (*Swynerton*); Rhodesia (Deutsche Ent. Nat. Mus.).

Type in the Turin Museum.

The species is distinguished by the strongly reflected anterior margin of the pronotum, which is continuous with the lateral bands, so that these are connected with each other, when viewed from the ventral side. The lateral bands of the pronotum are bent down anteriorly at more than a right angle to the disk.

11. *Cyrtotria scabricollis*, Gerst.
(Pl. X. figs. 18, 24.)

Derocalymma (Cyrtotria) scabricollis, Gerstaecker, Mitt. Ver. Vorpomm. xiv. p. 34 (1883).

Gaboon (*Buchholz*); Cameroons (*Conradt*).

This, the only West-African representative of the genus, can be distinguished by the rugose and tuberculate pronotum with reflected and dentate posterior margin in the male and the dentate lower margin of the lateral bands in the female.

The following is a description of the female:—

Piceous. Head castaneous, finely punctate. Antennæ testaceous at base, remainder castaneous. Pronotum coarsely tuberculate and punctate, anterior margin reflected; lateral bands finely tuberculate, rather broad, anteriorly bent down at more than a right angle to the disk, not closely adpressed to disk, the pronotal channel being wide and shallow, posteriorly produced, their lower border dentate; from the ventral aspect the lateral bands are seen to be in communication with each other anteriorly, as in *C. jallæ*, Gig.-Tos; disk carinate, posterior margin dentate. Meso- and metanotum carinate, punctate, and with a few tubercles. Abdomen very finely punctate.

Total length 16 mm.; pronotum 4.9 × 4 mm.; pronotum, ♂, 4.4 × 4 mm.

♂ type in Greifswald Museum; ♀ type in Deutsche Entomologische National Museum.

Genus PLATYSILPHA, nov.

Allied to *Derocalymma*, Burm., but much broader, pronotum about twice broader than long. ♂ with tegmina reduced, quadrate, extending to the middle of the second abdominal tergite, marginal field very broad. Wings rudimentary. Meso- and metanotum only half the breadth of the pronotum, and first abdominal segment narrower than second; subgenital lamina transverse; styles absent. ♀ very like ♀ of *Derocalymma*, but broader and oval.

Type. *Perisphæria murina*, Walk.

The male of this species, when the tegmina are removed, presents the remarkable outline shown in the figure, suggesting that the flattened broad insect has developed from a narrow form such as *Derocalymma porcellio*, Gerst., the mesonotum, metanotum, and first abdominal segment retaining the primitive narrowness. The marginal fields of the tegmina have broadened relatively much more than the discoidal field, and it is these which fill the gap between the posterior margin of the pronotum and second abdominal tergite; the tegmina are capable of only the most restricted movement outwards, and in the living insects are doubtless never moved at all.

In the female, owing to the absence of tegmina, the thoracic and abdominal segments are all equally broad; it is the broadening of the tegmina in the male which appears to have prevented the broadening of the segments that they cover.

Platysilpha murina, Walk. (Pl. X. fig. 20.)

Perisphæria murina, Walker, Cat. Blatt. Brit. Mus. p. 178 (1868).

♂. Fuscous, with fine scale-like pubescence above. Head and antennæ piceous; eyes approximated. Pronotum posteriorly truncate; posterior angles acute, disk cucullate, margins lamellar, anteriorly slightly carinate. Scutellum prominent. Tegmina castaneous, rugose, posteriorly emarginate, radial vein beneath prominent, keeled. Wings shorter than tegmina, infuscated. Eight abdominal tergites visible, first to sixth divided by a transverse suture into a broad anterior portion and a narrow posterior portion; posterior angles of all the tergites produced. Supra-anal lamina quadrate. Cerci very short. Abdomen beneath piceous, nitid; sternites failing to reach lateral margins owing to overlapping of the tergites; subgenital lamina transverse. Legs piceous.

♀. Similar to ♂, but with a rust-red pubescence above; mesonotum, metanotum, and first abdominal segment not coarctate. Subgenital lamina ample.

♂. Length of body 22 mm.; tegmina 7 × 7 mm.; pronotum 7 × 12 mm.

♀. Length of body 27 mm.; pronotum 9 × 18 mm.

E. Africa (British Museum) [type ♀]; Petauke, East Loangwa district, N.E. Rhodesia (Oxford Museum), 3 ♂♂, 4 ♀♀, S. A. Neave Coll.

I have no information as to the habits in life of this species, but I imagine that it, like the allied species of *Derocalymma*, is found under stones. This mode of life in numerous cases induces a flattened form with reduction of the tegmina; the broadening and flattening of the body may be observed, though to a less extent, in such species as *Tennopteryx phalerata*, Sauss., and *Heminauphæta sakalava*, Sauss. & Zehntn.; in these species also the tegmina are reduced and quadrate, and the constriction of the body in the middle has also occurred to a certain extent, and one may assume that it is correlated with the broadening of the reduced tegmina.

EXPLANATION OF THE PLATES.

PLATE IX.

- Fig. 1. Pronotum of *Protagonista lugubris*, sp. n. × 3.
 Fig. 2. Supra-anal lamina of ♂ of *Protagonista borneensis*, sp. n.
 Fig. 3. Right tegmen of *Cardax willeyi*, gen. et sp. n. × 10. *r* = radial vein; *u* = ulnar vein; *a.u* = anterior ulnar vein; *p.u* = posterior ulnar vein; *m* = median vein; *a* = anal vein; *ax* = axillary vein; *d* = dividing vein.
 Fig. 4. Right wing of ditto.
 Fig. 5. Mandible of ditto.
 Fig. 6. Maxilla of ditto.
 Fig. 7. Tibia (outer aspect) of ditto.
 Fig. 8. Apex of abdomen of *Ischnoptera longstaffi*, ♂ (dorsal view).
 Fig. 9. Wing of *Anaplecta erythronota*, sp. n.
 Fig. 10. Diagrammatic transverse sections through pronota of Blattidæ. A, typical Blattid; B, *Pronaonota*; C, *Pilema*; D, *Bantua*; E, *Derocalymma*. *a* = disk of pronotum; *b* = lateral wings or lateral bands; *c* = typical carinæ; *d* = dorsal carinæ.

PLATE X.

- Fig. 11. Pronotum of *Cyrtotria macra*, Stål, ♂, dorsal and lateral views. × 4.
 Fig. 12. Pronotum of *Cyrtotria gibbicollis*, Stål, ♀, dorsal and lateral views. × 4.
 Fig. 13. Pronotum of *Cyrtotria capucina*, Gerst., ♀, three-quarter, ventral, and lateral views. × 3.
 Fig. 14. Pronotum of *Cyrtotria poduriformis*, Wlk., ♀, dorsal and lateral views. × 4.
 Fig. 15. Pronotum of *Cyrtotria marshalli*, sp. n., ♀, three-quarter view. × 3.
 Fig. 16. Pronotum of *Cyrtotria pallicornis*, Kirby, ♀, three-quarter view. × 3.

- Fig. 17. Pronotum of *Cyrtotria nysæ*, sp. n., ♀, dorsal and lateral views. × 4.
 Fig. 18. Pronotum of *Cyrtotria scabricollis*, Gerst., ♂, dorsal and lateral views. × 4.
 Fig. 19. Pronotum of *Cyrtotria jallæ*, Gig.-Tos, ♀, ventral and three-quarter views. × 3.
 Fig. 20. *Platysilpha murina*, Walk., ♂, left tegmen removed and shown from beneath. × 1½.
 Fig. 21. Pronotum of *Cyrtotria latipennis*, Kirby, ♂, three-quarter view. × 3.
 Fig. 22. Pronotum of *Pilema mombasæ*, sp. n., ♀, dorsal view. × 3.
 Fig. 23. Ditto, ditto, lateral view. × 3.
 Fig. 24. Pronotum of *Cyrtotria scabricollis*, Gerst., ♀, dorsal and lateral views. × 4.
 Fig. 25. Thorax of *Bantua ferox*, sp. n., ♀, dorsal view. × 3.

XXVII.—*On a new Oribi obtained by Major Powell-Cotton in British East Africa.* By OLDFIELD THOMAS and R. C. WROUGHTON.

THE Natural History Museum has recently received from Major Powell-Cotton some specimens of *Oribi* for identification. Amongst them are several from the Guas-ngeshu Plateau, E. of Mt. Elgon, which appear to us to represent a new species.

The material available for comparison in the Museum, though scanty, seems to indicate that North-eastern Africa (*i. e.* north of Equator and east of 25°) contains four already-known forms, viz. :—(1) *O. montana*, Cretzschm., in Abyssinia and the Soudan, occupying the whole area down to 5° N. latitude, and distinguishable by its short slight horns; (2) *O. haggardi*, Thos., on the coast; (3) *O. kenyæ*, Meinerzh., round Mt. Kenya; and (4) *O. goslingi*, Thos. & Wrought., from the Welle Basin.

Of these *O. kenyæ*, by its black tail and narrow preorbital fossa, shows unmistakable affinity with the more southern form *O. hastata*, Peters, from Mozambique; and *O. haggardi* differs from all the rest by its shallow skull and by the compression of its horns posteriorly so as to make a more or less distinctly marked longitudinal ridge.

From *O. montana* the present species is at once separable by its long stout horns, while from *O. goslingi* it differs in wanting the black blaze on the face which is so characteristic of that animal.